MEG 65

1-4 MEGABYTE RAM CARD FOR ATARI 65XE COMPUTERS

INCLUDES UTILITIES SOFTWARE

(RAM NOT INCLUDED)

MEG65 INSTALLATION (Rev. A)

CAUTION: This product should only be installed by persons with proper training in the art of soldering. Newell Industries will not be held responsible for damage to the computer due to neglect or carelessness. Read these instructions completely before beginning.

The MEG65 upgrade can be installed using different combinations of bits of the $D301 address port of the 6520 PIA. The 130XE uses bit 4 (low) to enable Main cpu banking, and bit 5 to enable Antic (screen pro.) banking. It uses bits 2 & 3 to determine which of the four 16K banks is active. The 130XE uses 2 sets of ram banks and flip flops the CAS line to activate the banked memory. Unfortunately bits 0,1,& 7 are also used. See below.

$D301 PIA PORT B BIT ASSIGNMENTS (UNMODIFIED 130XE)
        BIT 0-O.S. ROM CONTROL, 1=ROM, 0=RAM
        BIT 1-BASIC ROM CONTROL, 1=RAM, 0=ROM
        BIT 2-RAM BANK SELECT, 1=RAM, 0=RAM
        BIT 3-RAM BANK SELECT, 1=RAM, 0=RAM
        BIT 4-CPU BANK ENABLE, 1=NOT ENABLED, 0=ENABLED
        BIT 5-ANTIC BANK ENABLE, 1=NOT ENABLED, 0=ENABLED
        BIT 6-NOT USED
        BIT 7-DIA.ROM CONTROL, 1=RAM, 0=ROM

GENERAL INSTALLATION

The H2 ribbon cable wires 1(red)=HALT, 2=DEL, 3=REF, 4=AB0, 5=AB1, 6=AB2, 7=AB3, 8=AB4, 9=AB5, 10=AB6, 11=CASO, 12=CASI, 13=MAP, 14=AB7.
The H3 ribbon cable wires 1(red)=A14, 2=A15, 3=A6, 4=A7, 5-6=SPARE, 7-14=D0-D7.

Refer to drawings at end of instructions.

1.Disassemble computer and remove the motherboard. Locate U6 (Freddy chip next to Basic). Reffering to drawing, confirm these traces are correct and them cut the ones marked 'x' going to pins 22 & 23. On the bottom of the motherboard cut the trace coming off pin 22. Strap 23 to the feed thru hole of the trace you cut going to pin 22. Follow the traces on the top of the motherboard that you cut, back to the feed thru holes and connect the one that was going to pin 23 to pin 22 and vice versa. Connect motherboard to the monitor & power supply, and test the computer. This mod only changes the muxing of address lines 13 & 14 in the Freddy so we can bank properly. If alls OK, go to step 2. If not, fix it and continue.

2.Remove the ram chip from U12 and plug it in U17 of the MEG65 board. Install H1 cable in U12. Make sure that pin 1 matches up. Solder or socket. Place the meg board so that the component side is up.

3.On the PIA, remove pins PB1(11), and PB7(17) from the motherboard and bend them out. Be careful not to damage the motherboard or break the pins off at the IC. Do the same for pin 35 of U6 (Freddy)

4.Connect the ribbon cable wire connections below:
H2

Wire to Location				Wire to Location		
1 - ANTIC IC PIN	9			8 - PIA IC,pin	14	
2 - U18 IC PIN	3			9 - ''	15	
3 - ANTIC IC PIN	8			10 - ''	16	
4 - PIA PIN	17			11 -ANY RAM PIN	15	or U6 HOLE 35
5 - ''	11			12 - U6 PIN	35	
6 - ''	12			13 - PIA 'HOLE'	17	(1 MEG ONLY)
7 - ''	13			14 - PIA IC pin	10	(4 MEG ONLY)

H3

1 - U6 PIN	22		8 - BASIC PIN	10	
2 - ''	24		9 - ''	11	
3 - ''	14		10 - ''	13	
4 - ''	15		11 - ''	14	
5 - N/C			12 - ''	15	
6 - N/C			13 - ''	16	
7 - BASIC PIN	9		14 - ''	17	

N/C= No Connection; For 4 meg installation see 4 MEG INSTALLATION below.

5.To be able to select the internal basic, connect a toggle switch between ground and the motherboard where PB1 was removed (PIA 'HOLE' 11). The switch is not much different than the Option Key, and I found it more versatile.

6.Install the 8 DRAM's (1 or 4 meg x 1, 120NS min., CAS before RAS refresh). Notch towards the capacitors.

7.Make sure that the meg board is not shorting to anything and turn the computer on. If installation was done properly the computer should come up in the same manner that it did before this installation was done. If not, correct the problem (see trouble shooting) and try

again.

8.When putting the computer back together, use extreme caution to make sure that the meg board does not short out anything. If you used sockets, you may not be able to install the top RF sheild. Don't force it.

Compatability

This method is compatable with Basic XE, the translator disk, and any other software that requires bit 0 to remain in its normal configuration. This method does allow Antic control via bit 5. With this method, internal basic is lost via software control. This is probably the most compatible method, and the one that I use and recommend.

$D301 PIA PORT B BIT ASSIGNMENTS:
BIT 0-O.S. ROM CONTROL, 1=ROM, 0=RAM
BIT 1-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 2-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 3-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 4-CPU BANK ENABLE, 1=NOT ENABLED, 0=ENABLED
BIT 5-ANTIC BANK ENABLE, 1=DISABLED, 0=ENABLED / RAM BANK SELECT, 1=RAM, 0=RAM
BIT 6-RAM BANK SELECT, 1=RAM, 0=RAM
BIT 7-RAM BANK SELECT, 1=RAM, 0=RAM

4 MEG INSTALLATION

This method is NOT compatable with Basic XE, the translator disk, or any other software that requires bits 0, and/or 1 to remain in its normal configuration. This method does not allow Antic control. If Antic addresses the banked memory area ($4000-$7FFF), it will see the banked memory currently there. With this method, internal basic is lost via software control. Access to the ram under the OS is also lost.

We are going to connect the lines that normally go to the enable bits to ground. This will mean that the 4 meg banked memory area is always active, so we are going lose the 16K bank of main memory, and replace it with 16K of the banked memory. This will cost you 16K of ramdisk for a total of 4080K available.

1.Remove PIA pin 10 from motherboard (see notes). Install the board following the above instructions. Note wires 13 & 14.

2.On the meg board, (refer to drawing) cut traces J1 & J2 marked 'x' and strap to GND as indicated. Install a 74LS158 chip in U13.

3. Connect a toggle, or momentary switch between PB7 (PIA pin 17) and 'HOLE' 17.
NOTE:This switch must be closed during power up (Atari and Omniview OS's) until you get a screen. It can be left off with OSNXL. If you want to use the internal diagnostics, or if you go into omnimon of the OSNXL, the switch must be on (closed). It must also be on while you go into 80 columns of omniview. Turn it off (open) all other times. For other OS's, refer to their documentation.

$D301 PIA PORT B BIT ASSIGNMENTS (4 MEG)
All bits control ram, 256 banks of 16K each.

Notes

1. It is possible to maintain OS banking using 4 megs. It requires moving the OS into the ram before any banking of that bit occurs, but remember that when you manipulate bit 0 to low to bring the ram in under the OS, it will also change the bank at $4000-$7FFF. If you wish to do this, leave PIA pin 10 connected to the mother board and use 'MOVEOS' file on the disk appended to the autorun.sys file if you like.

2.As you noticed in note 1, these installation instructions cover what I believe to be the best installation method of the MEG upgrade. By no means does it cover all the methods of installation. Contact us if you have questions about other methods.

Helpful hints:

If you have read these instructions and do not understand them, then do not attempt this installation without assistance. For assistance, you may call Newell Industries between 9 and 5 CT. Collect calls will not be accepted.

Plan the routing of the jumper wires before you start. If you feel that you cannot do the installation yourself, and cannot find anyone locally to do it, Newell Industries will install the upgrade for $40.00 (includes shipping).

TROUBLE SHOOTING

1.BLANK SCREEN

This could be caused by numerous things. Did you close the PB7 switch (4 meg)? Check wires

H2-11, 12, & 13. Check all ICs for bent pins. Check for shorts in soldering. Check motherboard where pins were removed.

2.MYDOS WILL NOT BOOT RAM DISK-ERROR MESSAGES DURING TEST RUN

Check solder connections for bad solder joints or shorts. Check AB0-AB7 to proper pins. Check REF to pin 8 of ANTIC. Check data lines to proper locations, opens, or shorts.

3.UNKNOWN

The chances of your having a defective meg board are very small. THE MOST COMMON CAUSE FOR PROBLEMS ARE IMPROPER INSTALLATION. If you have double checked your installation and it still does not work, contact Newell Industries for further assistance.

WARRANTY

Newell Industries will repair or replace any defective part for a period of ninety days from date of purchase at no charge. This excludes parts that have been mishandled or modified in any way.

If you have installed the meg upgrade in your computer and cannot get it to function properly, you may send your computer to Newell Industries and it will be repaired and returned to you at no charge if it is determined that the upgrade parts are defective. If improper installation is the cause of the failure, Newell Industries will correct the installation and return the tested board to you COD for charges.

USING YOUR MEG BOARD

There is a simple program that checks one byte of each bank of memory to insure that they are working. It is on the disk furnished. The filename is "M1TEST1M.BAS". When this program is ran, it should come back with "TEST COMPLETE, 0 ERRORS". If you get any ERROR messages back, refer to the trouble shooting section. CAUTION, reboot your system after running this program. It alters memory, and may have some undesirable affects if the system is not rebooted.

MYDOS DISK OPERATING SYSTEM

The MYDOS disk operating system 4.50 M1 furnished with the meg upgrade is a patched version of 4.50. The patch was made to correct a problem in the ramdisk handler that would not allow the use of bits 0 and 1. Refer to the Mydos manual for setting up the various types of ramdisks available. The MYDOS manual is in .ARC files on the disk along with the unarc program. Move the files to the ramdisk to unarc them. The page sequence table in mydos starts at $0BBA and is high nibble C,A,8,6,4,2,0,E by low nible 1,3,5,7,9,B,D,F as shipped with this upgrade configured for method 1 installation.

M1COPY SECTOR COPIER

This program was designed to be used with the general installation of the meg upgrade. It should not be used with any other computer unless it is verified that it uses the same bank switching methods. The program resides at $8500, once loaded may be reran using the M option of DOS to run at $8500 (assuming it has not be overwritten by another program).

The ramdisk page sequence of the MYDOS with the upgrade is such that the copy program may be ran and copy as many disk as you like and return to DOS without loosing the RD directory including DUP.SYS and MEM.SAV. The ramdisk will not even know that part of it was used. Of course, if the ramdisk is full, you will loose the files in the last portion depending on the size of disk you copy. The page sequence for m1copy is high nibble 0,2,4,6,8,A,C,E by low nibble 1,3,5,7,9,B,D,F. Copying a 720K disk will only go up to the A7 bank thus leaving the normal 130XE banks and the dos lower ramdisk banks alone.

Use the 'L' command from DOS to load M1COPY. If you are going to copy 80 track or double sided diskettes, your disk drives must be configured prior to running the program. The program can be loaded from the ramdisk if you need to configure your drives. M1copy uses ONLY the banked memory area for copying, so nothing special is required.

The first prompt. **HOW MANY COPIES?**
Enter how many copies you want (1-99) and, if needed, the special characters to pass information to the program.

SPECIAL CHARACTERS
A "D" entered after the number of copies (exp. 25D) indicates that the diskette you are going to copy is a double density diskette.

A "Q" indicates that you want to copy 1440 sectors per diskette. (exp. 25DQ) This could be a 40 track double sided, 80 track single sided, or 80 track double sided diskette that you only want to copy the first 1440 sectors. Remember that the format option will format the new diskette to the configuration of the drive.

An "O" indicates that the diskette you are going to copy has 2880 sectors. (exp. 25DO) This would be an 80 track double sided diskette.

An "H" indicates that you just want to copy the first portion of the diskette, including the directory (369 sectors). (exp. 25H) This example would copy the first 369 sectors of any single density diskette.

NOTE: The last character entered will be the one used by the program. (exp. 1DHQ translates to 1DQ, 99QOHD translates to99HD) A "Return" without a specified number of copies will be interpreted as 153. (exp. H translates to 153H) "Return" must be after entry. (exp. 1H"Return")

SOURCE DRIVE?
Enter the drive number where you will put the diskette to be copied. (1-4) Do not press "Return". Drive density is automatically set on source disk.

DESTINATION DRIVE?
Enter the drive number that you will use to write the copies to. (1-4) Do not press "Return". Drive density must match source diskette. Using the same drive for source and destination will insure that the density matches.

VERIFY WRITES (Y OR N)
Press "Y" if you want to write with verify. This takes about 3 times longer to copy a diskette and is normally not used unless you have some very important diskettes to back up.

FORMAT (Y or N)?
Press "Y" if you want the destination diskette formatted automatically with every copy. Otherwise press "N". Do not press "Return".

INSERT SOURCE DISK, PUSH START
Follow this prompt to read your source diskette.

INSERT DESTINATION DISK, PUSH START
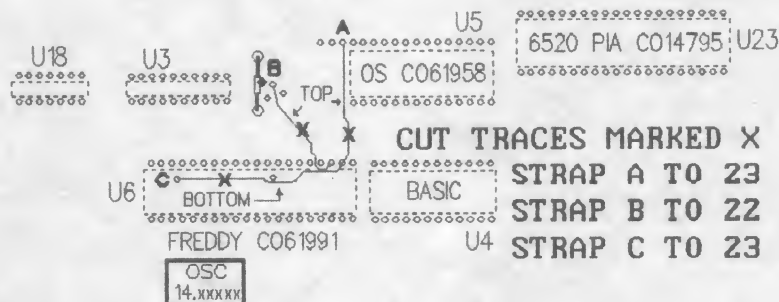Follow this prompt to write your copies.

UNREADABLE SECTORS
If unreadable sectors are encountered, after a few tries, the program will continue to the next sector, using whatever data it got from the bad sector to write to the destination disk, until the end sector is reached. This program is not intended to copy copy protected diskettes. Be aware that it is illegal to copy copyrighted software for any purpose other than backup.

U8 CPU CO14806-XX

U7 ANTIC CO21697-XX   POKEY CO12294 U22

U17 GTIA CO14805

U18   U3   A   U5   6520 PIA CO14795 U23
              B   OS CO61958
                  TOP

                            CUT TRACES MARKED X
U6 C   X   BASIC   STRAP A TO 23
     BOTTOM   STRAP B TO 22
                                   STRAP C TO 23
FREDDY CO61991   U4
     OSC
     14.xxxxx

65XE LAYOUT NOT TO SCALE   VIEW FROM TOP

4 MEG 65 XE

CUT
TRACES
MARKED   J1   ADD
                          JUMPERS
X   GND
             J2

74LS158

INSTALL 74LS158   (4 MEG ONLY)